who remember their, within certain limits of deviation, fixedness of type, will cordially agree with this.

The subject of dimorphism is alluded to, and the two quite distinct phenomena among Foraminifera described by this term are explained, but the author does not seem to select one of these above the other for the exclusive right to the term, as would seem desirable.

One of the most interesting subjects in reference to deep-sea deposits is their direct connection with the pelagic species of Foraminifera. As a rule these forms are not of pelagic habit; on the contrary, probably 98 or 99 per cent. of the known species or varieties live in the sand or mud of the sea-bottom, and possess no powers of floating or swimming; but, on the other hand, some few forms, belonging to eight or nine genera, do most certainly pass their existence either in part or in whole at the surface of the ocean, or floating at some depth below that surface. These forms are found, too, in immense profusion, and a relatively very large mass of the oceanic deposits consist of their calcareous shells. A list of the at present ascertained pelagic forms is given. The most prominent genera are Globigerina, Pulvinulina, Hastigerina, Pullenia. The question seems still unsettled as to whether the species are exclusively pelagic, passing the whole of their time living at or near the surface, or whether they can or do pass a certain portion of it on the sea-bottom. Mr. Brady adduces a series of facts which tend to the inference that the Foraminifera which are found living in the open ocean have also the power of supporting life on the surface of the bottom-ooze, and further, so far as our present knowledge goes, there is at least one variety of the genus Globigerina which lives only at the sea-bottom; but the author is most cautious not to express any dogmatic opinion on the subject.

In dealing with the composition of the test, the presence of a considerable percentage (6 to 10) of silica has been established as existing in the arenaceous forms. The substance secreted for the incorporation of the foreign bodies which cover the test has been proved to be composed of ferric oxide and carbonate of lime in variable proportions, the former being often in considerable excess. It is not without interest to note the presence in some of the porcellanous forms of a thin siliceous investment. A few Miliolæ from soundings of a depth of about four and a half miles, with somewhat inflated segments, scarcely distinguishable in form from young thin-shelled specimens of a common littoral species, were found to be unaffected by treatment with acids, and upon further examination it became apparent that the normal calcareous shell had given place to a delicate homogeneous siliceous investment. While immersed in fluid, the shell-wall had the appearance of a nearly transparent film, and this when dried was at first somewhat iridescent.

A list is given of those stations from which soundings or dredgings were obtained in sufficient quantity to furnish good representative series of Rhizopods, and maps are appended showing the tracks of the *Challenger*, with these stations marked, as also of the areas explored by the *Porcupine* and the other northern expeditions.

Any generalised summary of the details of the new forms would be impossible. Of the several hundred species described and figured, over eighty are here noted for the first time, and this without counting numerous well-marked and named varieties, or the numerous new forms already diagnosed in Mr. Brady's preliminary Reports.

The family Astrorhizidæ is the one which has received the largest number of additions; indeed our acquaintance with the larger arenaceous Rhizopods is almost entirely derived from the various recent deep-sea explorations. A knowledge of the life-history of these forms is still needed to place the classification of the group on a secure basis, and as some few of the forms are inhabitants of comparatively shallow water, their investigation would seem to be well worthy of the attention of observers at some of our zoological marine stations. Many other problems to be solved are also pointed out in this Report, the extreme value of which will be recognised by all students of biology.

THE ENGLISH FLOWER GARDEN

The English Flower Garden: Style, Position, and Arrangement. Followed by a Description, Alphabetically Arranged, of all the Plants best suited for its Embellishment; their Culture, and Positions suited for each. By W. Robinson, with the co-operation of many of the best Flower Gardeners of the day. Illustrated with many Engravings. (London: John Murray, 1883.)

A LOVE of flowers seems more or less characteristic of most human beings, and the tending and caring them is to most people a pleasant labour. Their brightness of colour, their charm of form, the sweetness and refreshingness of their varied perfumes please and delight the senses, while the mystery of their lives and deaths captivates the mind and awakes up the pleasures of hope. In no European country has this love of flowers been more manifested than in England, so that a flower garden seems an indispensable adjunct of an English home. It too often happens that many of those who love flowers have not the knowledge requisite to take care of them, and then the flower garden is handed over to the care of others. What to grow and what not to grow becomes then not so much a question of deliberate enlightened forethought as a thing of fashion, commonplace and unstable. No honest lover of Nature, no one who has once known the beauties of plant life, could ever for a moment remain pleased or satisfied with the arrangement of things out of place which is so peculiarly characteristic of one style of modern English gardening. It was not always thus: anywhere in Continental Europe that one visits "Le Jardin anglais" of some fine demesne or of some public park, there one is sure to find some attempt to form a natural prospect by the judicious arrangement of tree, shrub, flower, and grass; but in England itself, the very home of Sylvia, all traces of Nature are too often obliterated, and a meretricious display of colour, inclosed within a sharply defined geometrical sameness of outline, takes the place of a refreshing contrast in contour accompanied with joyful surprises of brightness. What a difference there is in the pleasure of viewing a large mass of *Gentiana acaulis* in the centre of a wide expanse of scarlet geraniums encircled with yellow calceolarias and viewing some few tufts of the same plant opening their blue corollas amid the grass by the borders of some Alpine meadow. Those who love gardens and like to see in them some few touches

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of Nature owe a debt of gratitude to Mr. W. Robinson for his life-long labours in disturbing our minds as to the correctness of modern views on gardening, and for in a great measure destroying the miserable conventionality that had made our gardens bad imitations of very inartistic carpets, or of nightmare-giving wall-papers. But in destroying what was bad it was also most desirable to build up something good to replace what was gone, and in the present most welcome volume we find indications, clear and distinct, of the abounding wealth of flowers at our disposal which are fitted for the embellishment of our open-air gardens. In the compilation of this work on the "English Flower Garden," Mr. Robinson has had the co-operation of some of the most practical and thoughtful writers of the day, and also the valuable aid of Mr. W. Goldring, whose experience as superintendent for some time of the Hardy Plant Department of the Royal Gardens at Kew has well qualified him for the task. The first part of the work—On Gardens, their Arrangement, &c.—is for the greater part from the pen of the author. We should have liked that a small portion of this part had been devoted to the subject of town and suburban gardens of small size. Many a modest cottage garden has, we read, its lessons to give, but then our ideas of a modest cottage garden are not helped by an illustration of the charming grounds attached to Sheen Lodge. The second part contains in alphabetical order a list of the more important genera and species of plants which will grow in the open air in Great Britain or Ireland, with figures, some very good, some indifferent, of most of the more attractive species. In some few cases we notice figures given which are not referred to in the text; when these are not of "desirable" species for the flower garden, as in the case of *Gentiana lutea* and *Scilla maritima*, it would have been better to have put others in their place. To all our readers who have or contemplate having a garden we cordially recommend this very excellent book.

OUR BOOK SHELF

The King Country; or Explorations in New Zealand. By J. Kerry-Nicholls. (London: Sampson Low and Co., 1884.)

In this interesting volume Mr. Nicholls describes a good stroke of exploring work. The King Country, with which his volume is largely concerned, is that district of the North Island of New Zealand which is still under the sway—not entirely nominal—of the King Tawhiao, who has only recently left our shores. It occupies a very large area between the west coast and the Lake Taupo region, having on its north-eastern border that wonderland with which the late Baron Hochstetter has made us familiar. The additional details of the sub-volcanic action of this region, its boiling springs and glistering terraces, are welcome. From Rotomahana Mr. Nicholls travelled southwards in a zigzag to Lake Taupo, and geologists will be specially interested in the observations regarding the great volcanic plateau on the south of Lake Taupo, and Mr. Nicholls's account of his ascent of Mounts Tongariro and Ruapehu, the former still in a state of volcanic activity. In fact there is abounding evidence that at no very remote period volcanic action must have been widespread and copious over a very large area of the North Island. Though not to be compared with the Southern Alps, which Mr. Green and his companions scaled last year, still Mr. Nicholls's feat was formidable and trying enough. In the King Country the natives have retained many of their original characteristics and customs almost unchanged, and therefore such narratives as that of Mr. Nicholls is of considerable value to the ethnologist. The region is richly wooded, the scenery in many places magnificent, and the geological features well worth minute investigation. In an appendix we find a list of the New Zealand tribes with their localities, and careful lists of the flora and fauna met with during Mr. Nicholls's journey. Altogether the narrative is interesting, and contains a good deal of fresh information. There is an excellent map and many attractive illustrations.

Forests and Forestry of Northern Russia and Lands beyond. Compiled by John Croumbie Brown, LL.D. (Edinburgh: Oliver and Boyd, 1884.)

The forestry of Russia has so recently been the subject of an article in our columns, that we need do little more than refer to this, the latest of the long series of volumes by Dr. Brown on his favourite *Forstwissenschaft* or forest science. It appears to have been compiled *apropos* of the International Exhibition of forest products in Edinburgh, and is intended "to introduce into English forestal literature detailed information on some of the points on which information is supplied to students at the schools of forestry on the Continent." The information contained in the volume has been obtained personally during journeys in Russia, or from the best official sources. There is also, it should be said, much to interest the most general and careless of readers, for Dr. Brown quotes extensively from the best recent writers on the districts of Russia to which his book specially refers.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

M. Thollon's Views of "Great B" in the Solar Spectrum

The excellence and power of M. Thollon's prisms have become proverbial in the spectroscopic world. For the sake, therefore, of having his own account of what he has himself seen (Nature, vol. xxx. p. 520), with physical apparatus of gigantic size, so well planned, so admirably constructed, and manipulated with such matchless skill,—doubtless every reader will make very little objection to any small accompanying inaccuracy in one outside reference.

To me, therefore, as well as probably to every one else, it is a very trifling matter that he should lay to my charge that I have said "Great B" does *not* increase in intensity as the sun approaches the horizon; although in my "Madeira Spectroscopic" book I have actually introduced Plate 5 to show, as compared with Plate 4, that it does so increase very notably.

But the real point of interest, of special importance just now, and perplexity too, is not that there is *some* effect of the telluric character in the "B" lines—but how much? and in what manner does it grow with zenith distance?

Now that residual question does not seem yet to have occupied M. Thollon, or he would have described the different rates at which the dry gas lines of "B" grow with zenith distance compared with the lines of watery vapour; and, as a first and easy result, he would undoubtedly have obtained, as I have with far inferior means, an indication that the water-vapour of the earth's atmosphere is confined to the lower strata only, while the dry gas composing "B" belongs more nearly to the whole atmosphere, high and low. To that too, at least; for some observations of "B" when near the zenith, or looked at through the shortest aërial path possible at the place, showed me so immense an intensity still in its lines, as to lead to the suspicion

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